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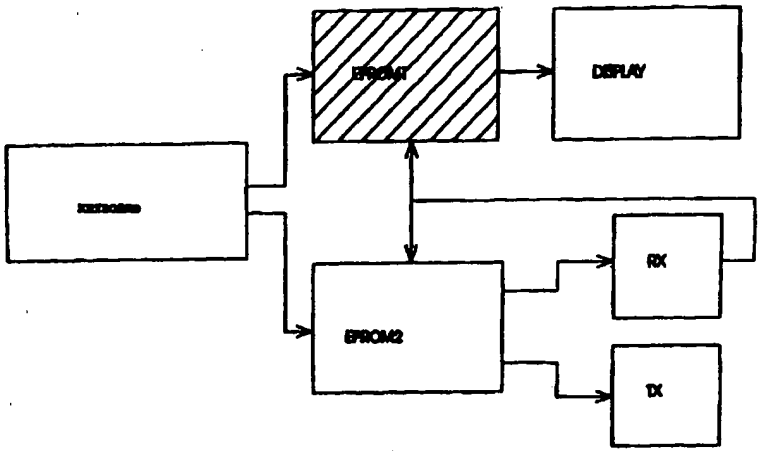

(57) Abstract

A portable electronic device having the size of a cellular phone and being able to facilitate communications and meetings among two or more people, consisting in a combination of: an alphanumeric keyboard, a display, a block (EPROM 1) which decodes the signals from the keyboard and/or a radiofrequency signal receiver and adjusts transmitting and receiving blocks (TX, RX), the first of which (TX) selects the transmitting frequency and modulates it with code signals, while the second (RX) selects the receiving frequency and detects the code signals which are transferred to the decoder block (EPROM 1) and a proximity detector, and then enables a Voice Communication block, the apparatus being arranged so that upon selecting a succession of keys the communication is established by radiofrequency signals only with apparatuses of the same type in which a succession of keys correlated to the first succession has been selected, each succession of selected keys being associated to a radiofrequency signal with a specific carrier.

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Electronic apparatus for facilitating communications and meetings among two or more people, commercial transactions, job application/offer.

The present invention relates to the field of the communications among people and, more particularly, an apparatus able to facilitate communications and meetings among two or more people sharing any type of interests, activity, hobby, etc.

In recent years many people have utilized the most varied solutions to meet new people and/or to get over loneliness, while other people look for a job or need to exchange goods. The answer to the loneliness problem is given by a number of offers via phone, especially those services obtained by dialling code number "144", as well as by agency's intermediations, specialized magazines and places of entertainment. However, those who resort to such services do not solve the loneliness problem but receive at most an often very expensive palliative without satisfying results.

Another negative aspect is given by that the user of such services is never in a position to manage by himself the contacts according to his requirements, but he is forced to resort to intermediators with the result of very high expenses.

The present invention provides an apparatus able to avoid or to limit the need of making use of such

services by offering an effective, economic alternative. Actually, the apparatus guarantees a series of advantages among which: low cost, easy use, free management, total autonomy, no intermediary, absolute discretion, immediate meeting possibilities, assured amusement, sole possession of the apparatus, no tax.

According to the invention there is provided an electronic apparatus which is able to send and to receive radiofrequency signals only to and from apparatuses of the same type. In addition to give everybody the chance of meeting new people and to get over loneliness, such apparatus cancels any discrimination caused by different human behaviours. In other words, it puts on the same level both those who wish to start a relationship based on feelings, friendship, affection, love, etc., and those who look for a relationship mainly or exclusively based on sex. Moreover, the invention excludes the differences among the various human behaviours allowing everybody to find one or more partners with the same inclinations and providing a wide range of coded behaviours.

As far as the applications of the invention to the field of economics, exchange of goods, job application/offer, etc., the described apparatus allows people who look for (offer) a determined type of product and/or job to find people who offer (look for) the same type of product and/or job.

In order to vary meeting and communication types and

to make the use of the present apparatus more versatile, a second embodiment of the invention provides interchangeable plug-in cards to be used alternately and allowing the same apparatus to be utilized for different interests and/or meetings. Such plug-in cards include some electronic components necessary for the operation of the apparatus and able to avoid interferences among apparatuses having different plug-in cards.

A further advantage of the invention is its considerable ease of use and the intuitive logic of its operation.

A better understanding of the invention will ensue from the following detailed description and the accompanying drawings which show, by way of a not limiting example, some preferred embodiments thereof.

In the drawings related to a first embodiment:

Figure 1 is a block diagram of the components of the apparatus;

Figure 2 is a diagram of the several areas of keyboard and display;

Figure 3 shows schematically the essential parts of the electronic circuit of the apparatus;

Figure 4 is a block diagram of block TX of Figure 1;

Figures 5 to 7 are electrical diagrams of some parts of the apparatus;

Figure 8 is a block diagram of block RX of Figure 1;

Figures 9 to 11 are electrical diagrams of blocks Tuning-Demodulator-Antenna, Decoder 1, and Decoder 2 of Figure 8, respectively;

Figure 12 is the electrical diagram of block Voice Communication of Figure 8;

Figures 13A and 13B show the block diagrams of S.O.S. transmitting and receiving circuits;

Figure 14 is the electrical diagram of S.O.S. receiving circuit;

Figure 15 shows the S.O.S. coder circuit;

Figure 16 shows the S.O.S. decoder circuit;

Figure 17 shows the S.O.S. proximity detection circuit and the acoustic alarm device;

Figures 18A and 18B are side and front views of a possible design of the apparatus, respectively;

Figures 19A, 19B, 19C and 19D show schematically four masks to be alternately applied to the apparatus.

According to the invention there is provided a portable apparatus having the size of a cellular telephone provided with keyboard and display which are operated by an initial selection of a succession of keys which allows the apparatus to communicate by means of radiofrequency signals exclusively with apparatuses of the same type in which a succession of keys correlated in some way to the above succession of keys has been selected, as explained hereinafter.

It is self-evident that the same apparatus can be operated to allow other kinds of meetings, for example, among sportsmen, hobbyists, traders, job applicants/offerers, etc.

With reference to Figure 1 the apparatus of the invention can be represented as follows:

- KEYBOARD block indicates a set of keys adapted to select a function;
- EPROM 1 block decodes the signals from the keyboard or the receiver RX and shows on the DISPLAY the relative messages;
- EPROM 2 block decodes the signals from the keyboard or the receiver RX and sets appropriately blocks TX and RX;
- TX block selects the transmitting frequency after modulation with coded signals;
- RX block selects the tuning frequency, detects coded signals and feeds the latter to EPROM 1 and EPROM 2 so as to start interphone communications.

Turning now to the other Figures, A and B indicate two

possible partners in a conversation.

Upon selecting a sequence in apparatus A, the same will transmit an "identification code" which is the same for all of the apparatuses, i.e. a constant low frequency signal (keynote) and a "selection code" depending on the selection operated on the keyboard. In order to make such codes able to be transmitted via radio, the same will modulate the amplitude of a carrier according to the succession of the pressed keys.

Apparatus A will also be set in the receiving mode waiting for a carrier (generally different from the transmitting carrier but related thereto) having a frequency correlated to the succession of the pressed keys.

If apparatus B (or more apparatuses) is waiting for receiving just the carrier transmitted by apparatus A as a result of the selected succession of keys, the relative signal is then demodulated. In order to prevent carriers of other transmitters from interfering with apparatus B, the latter is provided with a decoder able to detect the identification code of any received signal. If such identification code is present in the received signal, the decoder operates EPROM 1 so as to show on the display a suitable message, and starts the interphone communications. At the same time apparatus B will transmit a dual signal so as to operate apparatus A.

The detailed operation of the electronic apparatus is

described by an exhaustive examination of the block diagram of Figure 1.

KEYBOARD

It is formed of keys located on the front face of the apparatus for the selection of functions in reply to questions asked by DISPLAY block. The keys are divided into four areas (Figure 2) operated alternately by EPROM 2 block via logic gate circuits (Figure 3).

The three areas are called area A, area B, and area C according to the performed function.

Area A consists of five keys. The user utilizes four of them for a first definition of himself (herself) as well as people he (she) is looking for. The fifth key, so-called SCANNER, operates a scanning of the receiving frequencies.

Area B consists of nine keys. The user utilizes them to complete the definition started in area A.

Area C consists of fifteen keys corresponding to the same number of definitions able to describe the reason of the inquiry.

Upon pressing the keys of the keyboard, the corresponding input pins of the microprocessors takes on the logic state "0". In this way, EPROM 1, EPROM 2 blocks receive combinations of bits to be used for the programmed operations (Figure 3).

Three particular keys are further provided in the keyboard outside the above-mentioned areas as they can be used in any operation step (Figure 2):

- RESET key used to reset the apparatus to the initial

state;

- CONFIRMATION key used to confirm the operated selection;

- S.O.S. key used to transmit a help message to any apparatus able to receive it (Figure 2).

EPROM 1

It consists of a microprocessor (such as an EPROM ST62T/25) programmable in ASSEMBLER language and having twenty pins to be enabled as inputs and/or outputs as well as a further input pin (pin 5 for S.O.S. key) and a reset (pin 11 for RESET key).

In the described embodiment ten pins are used as input to be connected to keys of the KEYBOARD block and to the output of decoder 1 and S.O.S. decoder, and ten pins as output to be connected to the corresponding ten input pins of DISPLAY block (Figure 3).

The specifications of the program for controlling DISPLAY block depend on the selection of the messages to be shown on the display.

DISPLAY

It consists of a liquid crystal display with point matrix DMLCD such as for example LM093LN (Figure 3) having two lines of each sixteen characters (each character consists of 5x7 points). A map of alphanumeric characters is stored in such display. In order to display a character, EPROM 1 block gives the display the information about the coordinates of the map in which the character to be shown is located and

indicates the line and the column of the display in which such character is to be placed. In this way, the display shows any question and the relative answer selected by the KEYBOARD block.

EPROM 2

Also this block is directly connected to KEYBOARD block. It consists of two microprocessors of the above-mentioned type using each ten inputs and ten outputs.

As far as the inputs is concerned, eight inputs are used to detect what keys have been pressed so that each selection is stored and processed (Figure 3). This is accomplished by using a grid consisting of four lines and four columns, where each line and column are connected to one of the eight inputs. Upon pressing a key, the processors detect the same via the corresponding line and column. If a binary digit is associated to each key and if the selection of a key is stored, a binary digit used to set the outputs is obtained after the end of the selections.

TX

Such block can be divided into further four blocks as shown in Figure 4. The "Voltage TX" block consists of twelve resistances in parallel connected each to an output of the processors of EPROM 2 block (Figure 3). The values of the resistances are "weighed" according to the represented bit. The ohmic value of the resistances is equal to a power of two. Therefore,

according to the succession of bits present at the pins of the processor, the ohmic value of the resistances in parallel is an univocal function of the pressed keys. Different selections of keys will give different ohmic values of the resistances in parallel. If, for example, the resistance of pin 1 has the value $R_1=2^0$ Ohm (i.e. $R_1=1$ Ohm), the resistance of pin 2 is $R_2=2^1$ Ohm and so on until pin 12 with resistance $R_{12}=2^{12}$ Ohm. Therefore, the value of the equivalent parallel resistance is different according to what branch in parallel is at the logic state "1" (e.g. voltage 5V).

A voltage directly depending on the succession of the twelve bits is then present at the output of "Voltage TX" block. Such voltage is the same as that at the input of "VFO" block.

VFO (Variable Frequency Oscillator) is based on the principle of PLL (Phase Locked Loop) so that it oscillates with high stability. The frequency generated by such block is used as carrier to be modulated for transmitting low-frequency signals (Figure 5).

Coder 1 block generates a signal of predetermined frequency (identification code) depending on the selection of the values of resistances R_1, R_2 and the capacitance of capacitor C connected to pins 7, 6, 2 of chip NE555 (signal generator) as shown in Figure 6, respectively.

Also Coder 2 block generates a signal but the frequency thereof, which is not fixed, is determined

as a function of the pressed keys in area C (Figure 2). Actually, if binary digits are associated to the keys of such area C, the selection of keys can be stored.

Thus, if four further outputs of the processors of EPROM 2 block (preferably pins 13, 12, 9, 8 of processor 2) are used, the value of the equivalent resistance (Figure 3) can be set as a function of such outputs determined by the stored values.

The resistances are connected between pins 6 and 7 of chip NE555 of Coder 2 block (Figure 7). Accordingly, different selections correspond to codes with different frequencies.

The modulator block (Figure 5) uses the two output signals of Coder 1 and Coder 2 blocks for modulating the amplitude of the carrier generated by "VFO" block. Actually, the supply of fet FT1 is proportionally modulated by a modulation transformer according to the low frequency input signal.

"Antenna TX" block (Figure 5) consists of the transmitting antenna and a wide-band final amplifier (type MAV.11).

RX

Also such block is divided into further blocks (Figure 8). "Voltage RX" block utilizes the same principle as the already described "Voltage TX" block with the difference that the output pins (preferably pins 15, 14, 13, 12, 9, 8 of processor 1) are connected to the resistances (of "weighed" ohmic value) R_7, R_8, R_9, R_{10},

R_{11}, R_{12}, while the remaining output pins (preferably pins 7, 6 of processor 1 and pins 17, 16, 15, 14 of processor 2) are connected to resistances R_1, R_2, R_3, R_4, R_5, R_6 (Figure 3). In other words, the connections to the resistances are inverted with regard to "TX" block. Since the first six bits of the succession relate to the person who is looking for another person whom the following six bits relate to, such inversion causes that the two groups of bits are inverted in the receiving circuit. If for example the message is as follows: "red dog looks for white hen", a carrier related to such a message should be transmitted (it should be noted that different carriers correspond to different messages), while a carrier related to the message "white hen looks for red dog" should be awaited as received message.

Therefore, also in this case the succession of twelve bits is related to the value of the equivalent parallel resistance. Such resistance controls the voltage which is present across "Tuning" block.

Tuning block (Figure 9) consists of VARICAP diodes and coil L_1 which tune the frequency corresponding to the selection operated via keyboard.

"Antenna RX" block consists of a preamplifier TR1 and the relative receiving antenna, as shown in Figure 9.

"Demodulator" block consists of an amplitude demodulator which utilizes the superheterodyne principle and is able to demodulate only the signals detected by "Antenna RX" block and having a carrier with the same frequency as that selected by the

"Tuning" block. Such a function is performed by a mixer/converter FT1 which operates a first conversion, for example, at 10.7 MHz by mixing the frequency generated by local oscillator FT2 and the frequency set by "Tuning" block. After passing through a set of filters, the signal is amplified and converted a second time (e.g. by means of the chip SL.6601 at 455 kHz) by means of a quartz preferably of 10.24 MHz. The signal is detected through amplitude modulation by means of chip TDA.1220/B and then amplified by chip TDA.7050.

The demodulated signals are related to the two constant frequencies generated by the decoders of the apparatus, and namely:

- one frequency is a priori determined during the initialization so as to set all of the apparatuses on that frequency ("identification code");
- the second frequency has a value determined according to the selection operated by the keys of area C ("selection code").

Decoder 1 (Figure 10) detects the presence of the identification code in the demodulated signal so as to avoid that other radiofrequency signals (RF) having the same frequency as the carrier to be received can inadvertently operate the apparatus. Actually, only the presence of such an identification code causes the Voice Communication and Decoder 2 blocks to be enabled as well as EPROM 1 and EPROM 2 so that the display shows the suitable messages. The signals demodulated by "Demodulator" block are also fed to the input of

Decoder 2 (Figure 11). Such Decoder 2 is made by EPROM 2 block capable to recognize the selection code.

The four outputs used to set the code frequency of Coder 2 block are also used to set such frequency in Decoder 2 block. Also in this case, this is accomplished by connecting resistances of suitable values to the four outputs (preferably pins 13, 12, 9, 8) of processor 2 (Figure 3).

The configuration of such outputs is related to a suitable value of equivalent resistance. Such resistance value controls, through the pins 6 and 5 of a chip NE567 (Figure 11), the frequency value which the latter is able to recognize. Such resistance value is the same as that generated by chip NE555 of Coder 2.

Upon pressing a "voice key", the Voice Communication block allows two (or more) partners to talk like by an interphone.

Decoder 1 recognizes the identification code and enables transistor TR1 (Figure 10). The collector of such transistor is connected to a photocoupler which controls a flip-flop through the voice key (Figure 12). Upon switching on the apparatus, said flip-flop is always set so as to connect Decoder 1, Coder 1 and Coder 2. The operation of the flip-flop through the voice key excludes Decoder 1, Coder 1 and Coder 2, and connects the loudspeaker and the microphone, thereby allowing the interphone communication.

The apparatus operates as follows:

Upon switching on the apparatus, eight pins of both processors of EPROM 2 block are set as inputs. Such pins are used to connect all of the keys of "Keyboard" block (except RESET and S.O.S. keys which are always connected). This is made possible, as already mentioned, because of a grid of four lines and four columns so as to have sixteen keys which can be used at the same time. Since the selection keys are twenty-eight as a whole and considering also the CONFIRMATION and SCANNER keys, also a circuit consisting of logic gates (NOR and NOT) is used to control the keyboard as in Figure 3.

One of the three key areas can be alternately enabled and the other two areas disabled by using two outputs (preferably pins 7, 6 of processor 2 of EPROM 2 block) for controlling the above-mentioned logic gates. Thus, by using nine inputs, as many keys as necessary may be provided in the keyboard, the selection being carried out with sixteen keys at a time as a maximum.

Two pins (preferably pins 17, 16 of processor 1 of EPROM 2 block) are then used as output to enable or to disable TX block (Coder 1, Coder 2) and RX block (Decoder 1), and twelve pins (preferably pins 6, 7, 8, 9, 12, 13, 14, 15 of processor 1 and pins 14, 15, 16, 17 of processor 2) are used as output to represent the variables associated to the selections accomplished by keys of areas A and B of the keyboard.

In addition, pins 5 of ST62T/25 are used as inputs for S.O.S. key, and four pins (preferably pins 8, 9, 12, 13) of processor 2 of EPROM 2 block (Figure 3) are

used as outputs to represent the selections accomplished by keys of area C.

Finally, RESET key is connected to an appropriate pin (preferably pin 11) of chips EPROM 1 and EPROM 2.

Once the pins are set, EPROM 2 assigns to the two outputs controlling the circuit of the logic gates such a value as to enable area A and to disable the other two areas.

Thus only the four keys of selection of area A can interact with the processors.

A binary digit of two bits is associated to each four keys and in this way upon pressing one of such keys, the processors store the corresponding digit. As a result, EPROM 2 enables area B and disables area A through the circuit of logic gates.

Area B consists of nine keys (Figure 2) each associated to a binary digit of four bits. Therefore, also in this case, upon pressing one of the nine keys the processor stores the digit associated thereto. The two stored digits (forming the digit of six bits) are used first by EPROM 1 to send the relative message to the display and then by EPROM 2 to set the first six of the twelve outputs connected to the resistances.

After the execution of both selections described above the display shows a request of confirmation: if the selection is wrong, RESET key is pressed so as to reset and to start the apparatus again like upon switching on the same; if the selection is right, CONFIRMATION key is pressed.

At this time, the processor controls the logic gate

circuit again to enable area A and to disable area B. The same operations as above are repeated so that the display shows the messages related to the new double selection and the processor stores the binary digits associated to the new selections.

At the end of the operations two variables are present in the memory of the apparatus: the first variable includes a binary digit of six bits related to the first selection using areas A and B, while the second variable also includes a binary digit of six bits related, however, to the second selection using area A and B. The first variable represents the information of the "person (or couple) who is looking for" another "person (or couple)" whose information is represented by the second variable.

Upon setting the twelve outputs with the information of the two variables, each binary digit of twelve bits is associated to a different value of equivalent resistance, as explained with regard to the Voltage TX and RX blocks.

Once stored the last selection operated by the keys of area B, the processor disables the keys of areas A and B and enables those of area C by using the logic gate circuit (Figure 3). Also in this case the display shows an instruction message. Area C has fifteen keys, each of them is associated to a digit of four bits so that upon pressing any key the digit associated to the selection is stored. At this time, EPROM 1 block causes the display to show the relative message and the request of confirmation. If the confirmation is

given, a new message indicates that a new pressure on the CONFIRMATION key will start the process, i.e. the transmission and the reception.

If the CONFIRMATION key is pressed, the processor EPROM 2 compares the six bits of the first selection performed by means of the keys of areas A and B with the six bits of the second selection performed by the keys of areas A and B. If the result of such comparison is that the two groups of six bits are equal to each other, "TX" and "RX" blocks have the same carrier and then the two blocks are enabled alternately for a predetermined period of time in order to avoid interferences so that the apparatus operates alternately in the receiving and transmitting modes. This is accomplished by using the two transistors shown in Figure 3 as two switches controlled by two output pins (preferably pins 16 and 17) of EPROM 2. If the result of such comparison is that the two groups of six bits are different from each other, both "TX" and "RX" blocks are enabled at the same time because in this case the carrier of "TX" block is different from the carrier of "RX" block so as not to cause interferences.

At this time the processors give suitable values (0 and 1) to the twelve pins used for representing the selections performed by the keys of areas A and B and to the four pins used for representing the selections performed by the keys of area C.

The transmission and the reception of the selected messages, i.e. the research, is now started.

Assuming now that two apparatuses have stored key selections such as to be able to communicate to each other, the first apparatus transmits on a selected carrier the "identification code" and the "selection code" described above. Likewise, the second apparatus waits for the reception of any message transmitted on a carrier which is the same as that adjusted therein. When the second apparatus receives the carrier transmitted by the first apparatus which is just that carrier for which the second apparatus is waiting, the latter demodulates the two transmitted codes. Such codes are fed to Decoder 1 block which detects the frequency of the identification code (all of the apparatuses being adjusted on such frequency) and feeds a signal to EPROM 1 and EPROM 2 blocks and to the display so as to show a suitable message and to generate an acoustic warning signal indicating that a communication with another apparatus has been established.

Decoder 1 block has also the function of enabling, once detected the frequency of the identification code, the Voice Communication block and Decoder 2 block. The latter has at its input the two demodulated codes but only the "selection code" is recognized because the frequency thereof is that frequency adjusted through the selection keys of area C. In case also such second coded frequency, for which the second apparatus is waiting, is the same as that transmitted by the first apparatus, Decoder 2 emits two warning signals in order to indicate that the two apparatuses

have the same selections on areas A, B and C of the keyboard.

If such selections are not the same but the selection made by the keys of areas A and B is such as to put the two apparatuses in communication, only one warning signal is generated by Decoder 1 indicating that one of the partners has made a different selection by the keys of area C.

Once emitted the acoustic warning signal by Decoder 1, the Voice Communication block allows the conversation between partners. This is accomplished as soon as the "voice key" is pressed so that the two partners can advantageously communicate their locations and any information about a possible meeting. The whole communication process is assisted by suitable messages shown on the displays of the two apparatuses.

The apparatus is also provided with a system for receiving and transmitting a S.O.S. message (Figures 13A, 13B). The receiving part of such a message, which is similar to the already described receiving part of the apparatus, is separated from the latter because the apparatus should always wait for any such message unless intentionally disabled.

The operating principle is the same as previously described: the S.O.S. message is a mere carrier on which only the S.O.S. code is modulated in amplitude (Figure 14 and 15). Of course, such carrier is different from all possible carriers selected through any sequence of the already described keys. The

selection of such carrier is accomplished only by pressing the relative S.O.S. key.

Once pressed the S.O.S. key, EPROM 2 block disables any other function so that the apparatus does not operate in the receiving mode any longer but only transmits the help message.

Actually, the twelve output pins are set so as to provide a binary digit different from those associated to the selections operated by the keys of areas A and B. Thus a carrier used only for the help message is provided for the transmission of a S.O.S. code generated by S.O.S. Coder (Figure 15).

All of the near apparatuses (unless intentionally disabled) operates in a continuos mode of receiving any S.O.S. message. Once detected the carrier, the signal is demodulated and, if the latter carries the code of the apparatus according to the invention, S.O.S. Decoder block (Figure 16) enables the proximity detector emitting a suitable different acoustic warning signal and controls EPROM 1 so as to cause the display to show the relative message. The proximity detector emits an acoustic warning signal with varying frequency according to the distance of the help message emitter (Figure 17) as it detects the amplitude variations of the signal received by the S.O.S. antenna.

In case the communication is not established because the selections in the transmitting apparatus do not correspond to those in the receiving apparatuses, it

is then possible to enable a frequency scanner. Thus one can get to know what messages are selected by the other apparatuses. After the first selection accomplished by the keys of areas A and B defining the "person (or the couple) who is looking for", the processors of EPROM 2 block enables again area A and a further key designated by the word SCANNER. Therefore, if instead of carrying on the selection of the searched person (or couple) the latter key is pressed, EPROM 2 arranges the twelve outputs so that the first six outputs take on the values corresponding to the binary digit of six bits associated to the first selection operated by the keys of areas A and B, and the other six outputs take on all of the allowed combinations after one another. Furthermore, the transistors/switches are controlled so that only RX block is enabled. Thus a scanning is carried out so as to look for an apparatus which has the selection of a "searched person (or couple)" corresponding to the definition initially selected in the first apparatus. As soon as a carrier is detected by the scanning process, the display will show a message indicating what kind of person (or couple) is looking for partners. If the scanning apparatus wants to establish a communication with such a detected apparatus, it is sufficient to press the RESET key and to adjust the selection according to the information received on the display. If on the contrary the detected carrier is not of the desired kind, the SCANNER key is pressed again to carry on searching further carriers.

An apparatus able to allow a determined kind of meetings has been described, however, it should be understood that an apparatus equipped with a different number of selection keys in the keyboard may be provided. Of course, also the messages which are shown on the display change according to the kind of meetings they refer to. The possible selections may be more or less complex according to circumstances so that it is required a different number of keys.

A second embodiment of the invention provides an apparatus provided with plug-in cards made by using a SMD (surface mounting device) technology. In other words said plug-in cards include some components indicated in the circuits of Figures 3, 6, 10 and belonging to some dashed blocks (see Figures 1, 4, 8, 13b). These components are:

- processor ST62T/25 (Figure 3) called EPROM 1 including in the memory the display controlling program and all of the messages associated to any key;
- resistances R_1, R_2 and capacitor C of Coder 1 (Figure 6) which set the frequency for the "identification code";
- resistances R_1, R_2 and capacitor C of Decoder 1 which control the integrated circuit of Figure 10 for recognizing the "identification code".

Thus each card transfer its own function to the apparatus. It is possible to provide a card for any kind of interests and/or meetings, i.e. cards for love

and social relationships, job application/offer, sexual intercourse, and any other relation.

By inserting a particular card, the apparatus will promote an intuitive approach among people having the same interests through personal messages related to that particular field of interests which are shown on the display. This is facilitated by a suitable mask (Figures 19A, 19B, 19C, 19D) supplied together with each card to be applied on the keyboard so as to be integrated with the keys.

For example, each mask can be inserted through a transparent cover which allows the practical replacement in case the mask has to be changed together with the corresponding card. Each mask carries the definitions or symbols related to the associated card in positions corresponding to the selection keys. In addition, the display will show the message related to such definitions or symbols which are stored in the corresponding EPROM 1 of the card.

Advantageously said plug-in cards carry also the components which set the frequency of the "identification code", and avoid interferences among apparatuses which have different cards even if the latter carry out similar selections.

It should be noted that each apparatus, apart from the type of plug-in card, is able to receive (unless disabled) a help request (S.O.S.) transmitted by one or more apparatuses within its receiving range.

Advantageously, each card allows some or all of keys of the keyboard to be used. However, all of RESET,

CONFIRMATION, SCANNER, S.O.S. keys as well as the display may be used in any case as they are necessary for the operation of the apparatus. Thus it is possible to use the apparatus of the present invention for the most varied applications as it is sufficient to replace the card inserted into the apparatus with the desired card.

The procedure is similar to that previously described with regard to the first embodiment, however, it should be noted that a different number of keys (only the necessary keys) may be used from time to time and then the possible selections are more or less complex and more or less in great numbers.

According to a further embodiment it is also provided a second interchangeable plug-in card which is independent of the card described above and the operation of which is similar to that of the typical phone cards or toll payment card.

Actually such card allows the electronic apparatus to be used for a limited number of "meetings" with other similar apparatuses. Whenever an apparatus carries out a selection and gets in touch with another apparatus in which a selection corresponding to that of the former has been carried out, a credit unit is taken away from those stored in such card so that the credit is going to exhaust and the apparatus will be out of use. Once such card is exhausted, it is sufficient to replace it so that the device according to the invention can be used again. It is self-evident that

cards of different service life may be provided according to how long the user utilizes the apparatus.

The described apparatus is preferably supplied by cells and/or a rechargeable battery.

The present invention is described and illustrated according to some preferred embodiment thereof, however, it should be understood that those skilled in the art can make equivalent modifications and replacements without departing from the scope of the present industrial invention.

Claims

1. An electronic device able to facilitate communications and meetings among two or more people, characterized in that it consists in combination of: an alphanumeric keyboard, a display, a block (EPROM 1) which decodes the signals from the keyboard and adjusts transmitting and receiving blocks (TX, RX), the first of which (TX) selects the transmitting frequency and modulates it with code signals, while the second (RX) selects the receiving frequency and detects the code signals which are transferred to the decoder block (EPROM 1) and a proximity detector, and then enables a Voice Communication block, the apparatus being arranged so that upon selecting a succession of keys the communication is established by radiofrequency signals only with apparatuses of the same type in which a succession of keys correlated to the first succession has been selected, each succession of selected keys being associated to a radiofrequency signal with a specific carrier.

2. The electronic device of claim 1, characterized in that it is portable and has the size of a cellular telephone, is provided with cell or rechargeable battery power supply, and allows a S.O.S. signal to be transmitted in emergency case which can be received by any other apparatus if near enough and not intentionally disabled.

3. The electronic device of the preceding claims, characterized in that the presence of a radiofrequency signal, the carrier of which corresponds to the selection of keys, is shown by a message on the display, an acoustic warning signal, and the enabling of the Voice Communication block.

4. The electronic device of the preceding claims, characterized in that all of the possible combinations of pins (7, 6) of processor (1) and pins (17, 16, 15, 14) of processor (2) may be carried out by means of processors (1, 2) so as to scan the frequency and to detect the messages selected by other partners who are located in the transmitting range of the apparatus.

5. The electronic device of claim 4, characterized in that the scanning is stopped whenever a demodulator of the apparatus receives from the antenna a carrier (defined by the selection operated via the keyboard) so that block (EPROM 1) shows on the display the message corresponding to such carrier, while the scanning of the other carriers is prosecuted by pressing the keys (SCANNER) and the communications with the detected apparatus is established by pressing the key (RESET) and adjusting new selections according to the information received by the scanning.

6. The electronic device of the preceding claims, characterized in that there are provided one or more plug-in cards to be used alternately and able to

differentiate the type of meetings and to avoid interferences among apparatuses in which different cards are installed.

7. The electronic device of claim 6, characterized in that each interchangeable plug-in card includes integrated components necessary for the operation of the apparatus and namely:
- processor (EPROM 1) comprising in its memory the display controlling program and all messages associated to the keys;
- resistances R_1, R_2 and capacitor C of Decoder 1 which causes Decoder 1 to recognize the "identification code" so that only such "identification code" from Coder 1 of the card which is being used is accepted and recognized.

8. The electronic device of the preceding claims, characterized in that, since the identification codes are different from one another, there are no interferences among apparatuses having different cards, even if the frequencies used for the carriers are always the same.

9. The electronic device of the preceding claims, characterized in that it is able to accept a variety of cards which allow some or all of the keys of the keyboard to be used, the keys RESET, CONFIRMATION, SCANNER, S.O.S. as well as the display being always operative as indispensable for the operation of the

apparatus.

10. The electronic device of claim 9, characterized in that upon changing the card inserted in the apparatus with the desired card, the apparatus itself may be used for the most varied applications without replacing other parts.

11. The electronic device of the preceding claims, characterized in that there is provided an interchangeable mask to be applied on the keyboard of the apparatus and to be associated to any interchangeable card so as to give the user an indication about the keys which are available from time to time and about the specific functions thereof.

12. The electronic device of the preceding claims, characterized in that there is provided a second interchangeable card independent of the first card, the operation of which is similar to that of the typical phone cards or toll payment cards so as to allow the apparatus to be used for a limited number of "meetings" with other similar apparatuses.

13. The electronic device of claim 12, characterized in that whenever a selection is carried out in an apparatus which gets in touch with another apparatus in which a selection corresponding to the former has been carried out, a credit unit is taken away from the card which is thus going to exhaust and to make the

apparatus of no use, a replacement of such a card making the apparatus utilizable again.

14. The electronic device of claim 13, characterized in that there are provided credit cards of different service life or with a different number of credit units.

15. The electronic device of the preceding claims, characterized in that once established the communication with one or more apparatuses, the selection of which are correlated to that of the calling apparatus, the latter allows a communication with the other users through the Voice Communication block which is enabled when at least two apparatuses get in touch with each other.

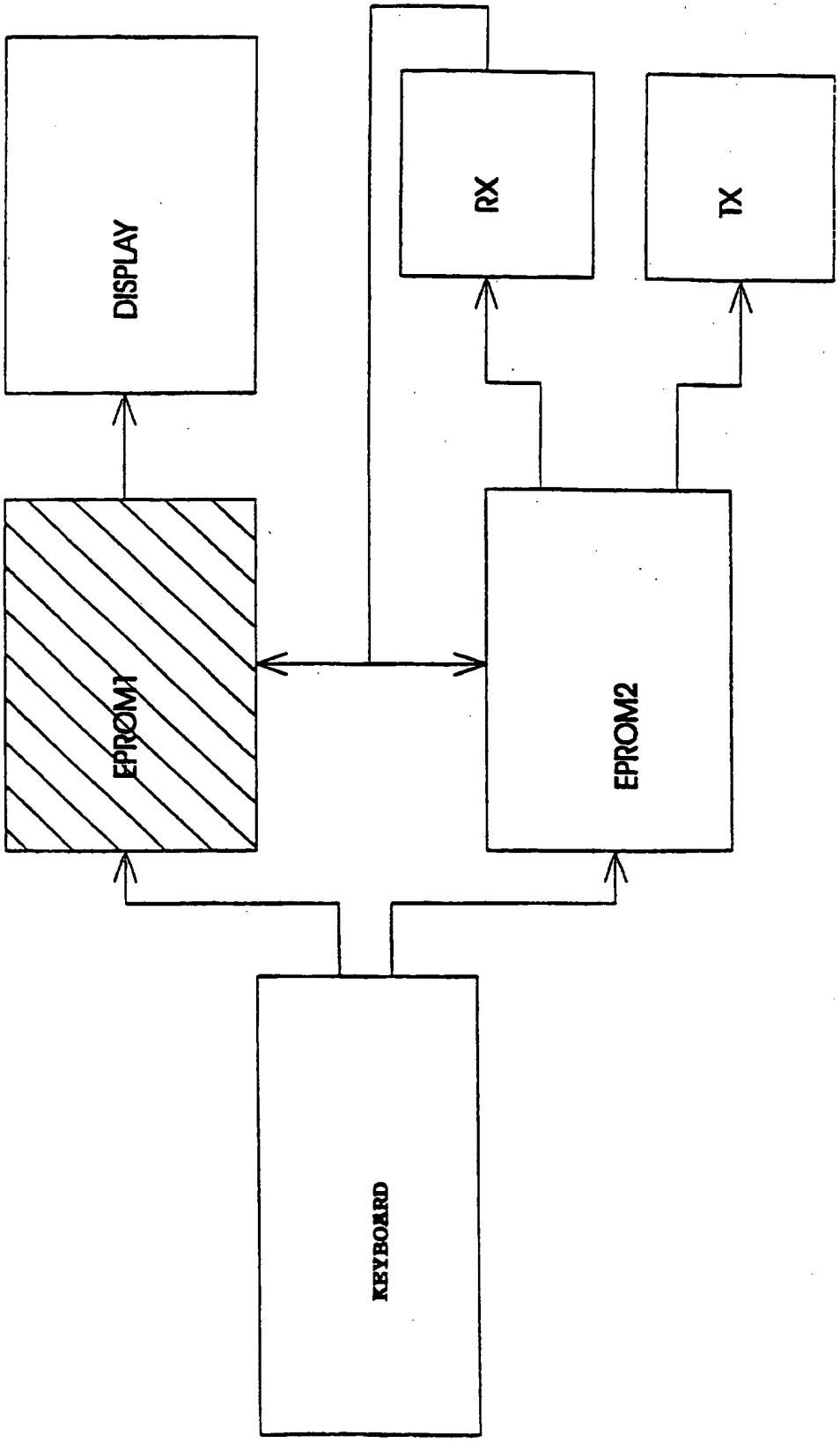

FIG.1

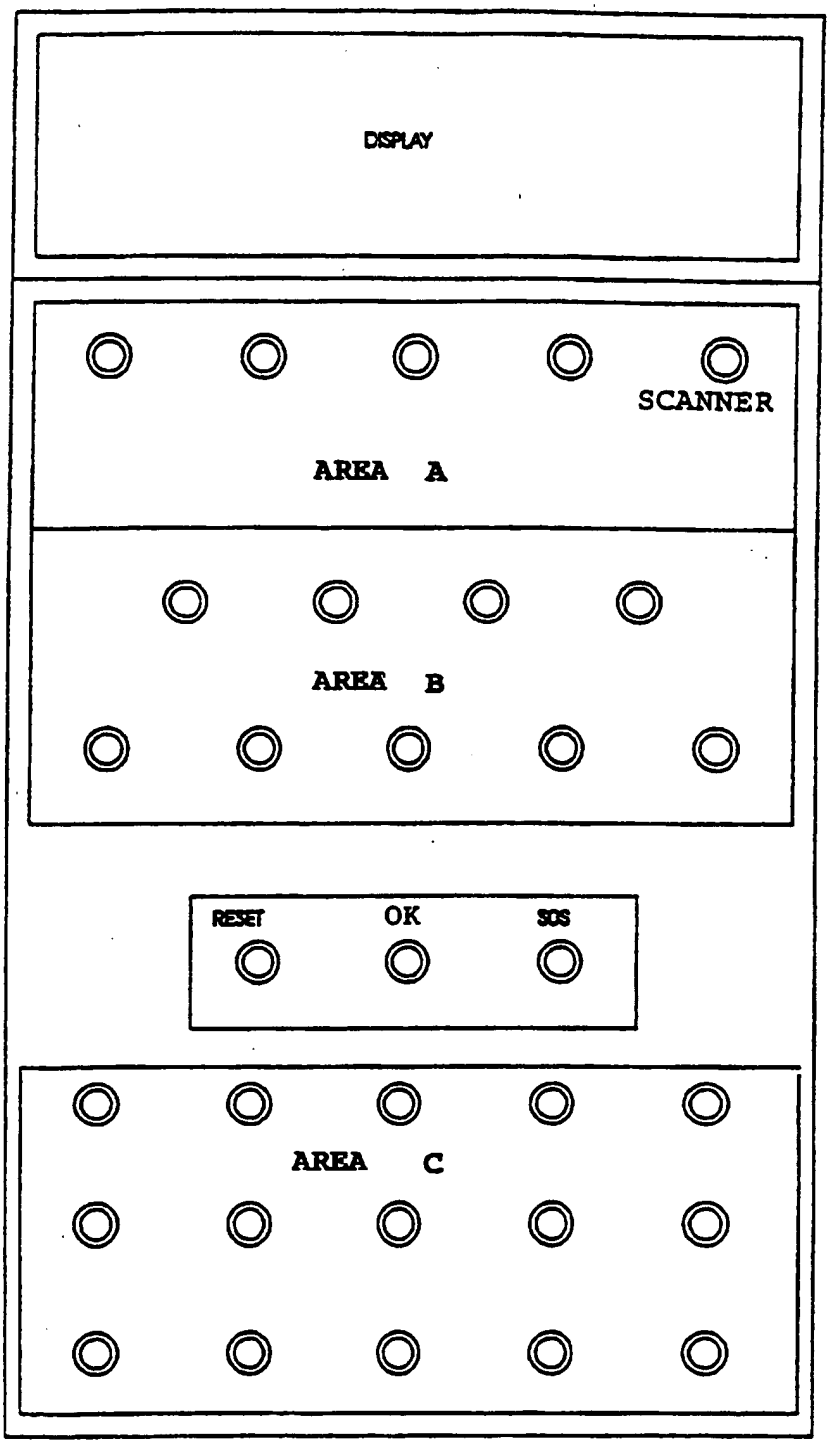

FIG. 2

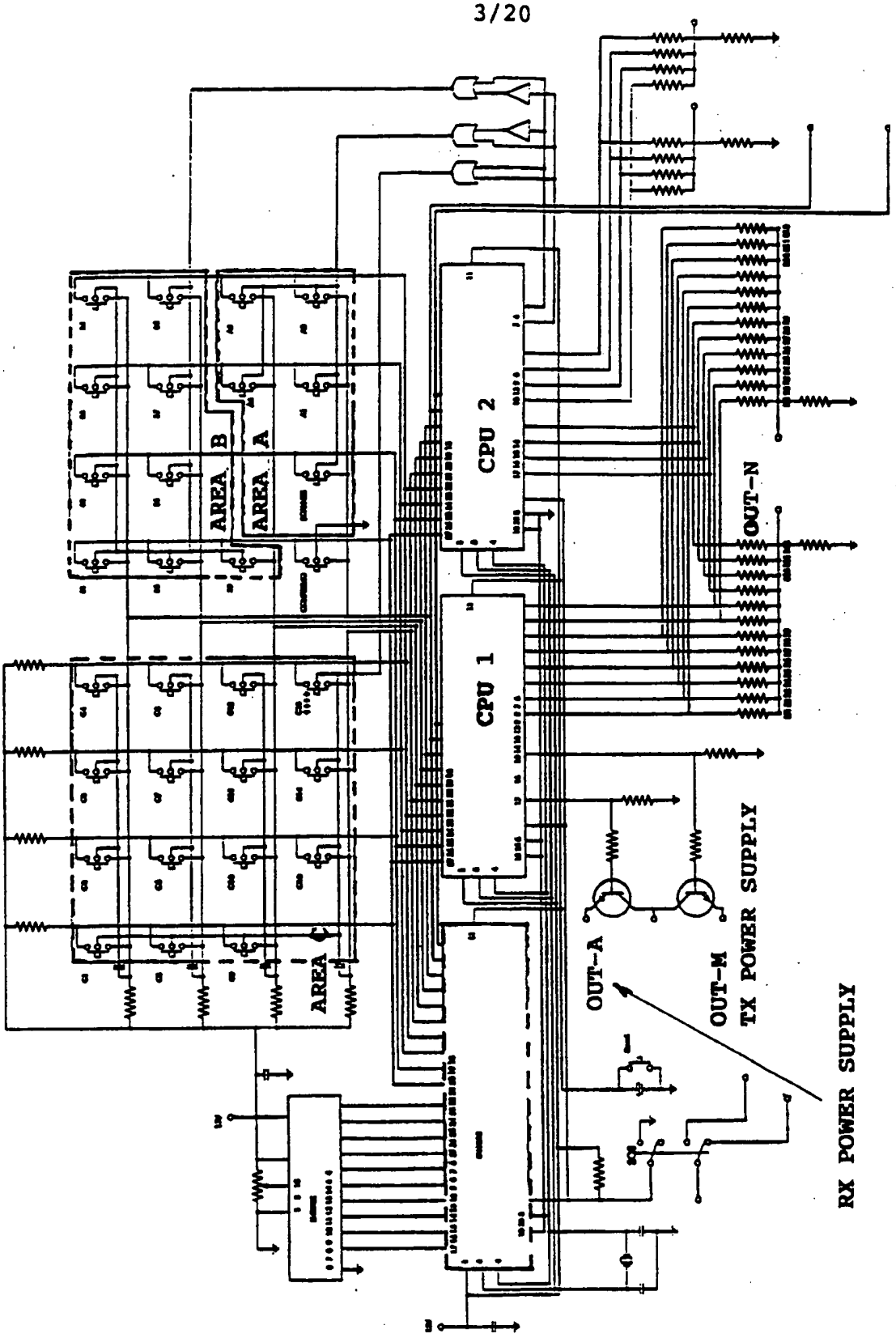
AREA B
AREA A
AREA C
CPU 2
CPU 1
OUT-N
OUT-A
OUT-M
TX POWER SUPPLY
RX POWER SUPPLY

FIG. 3

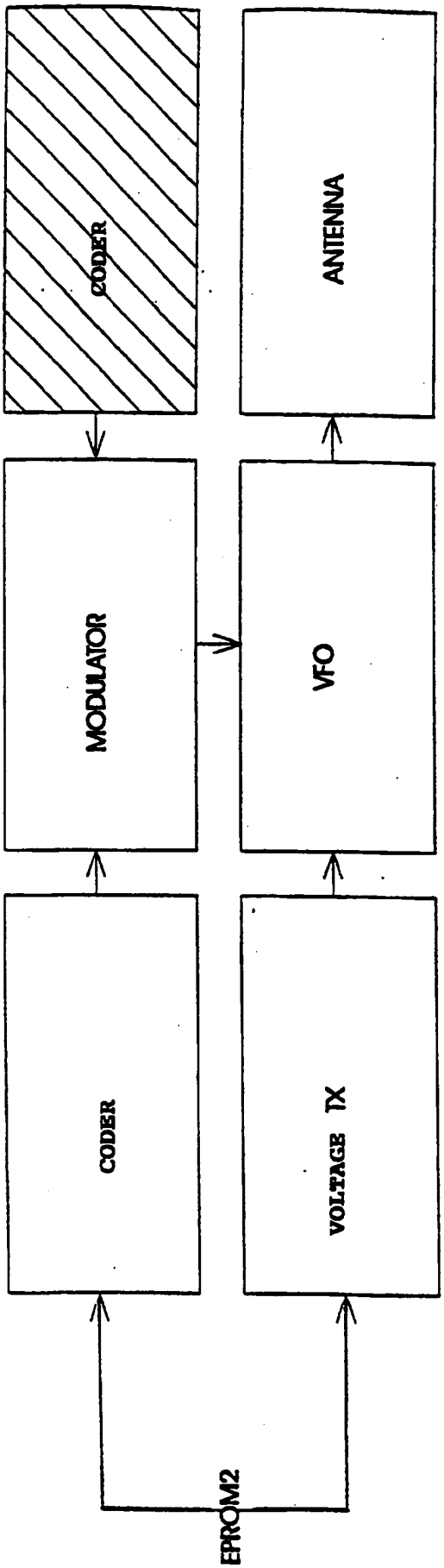

FIG.4

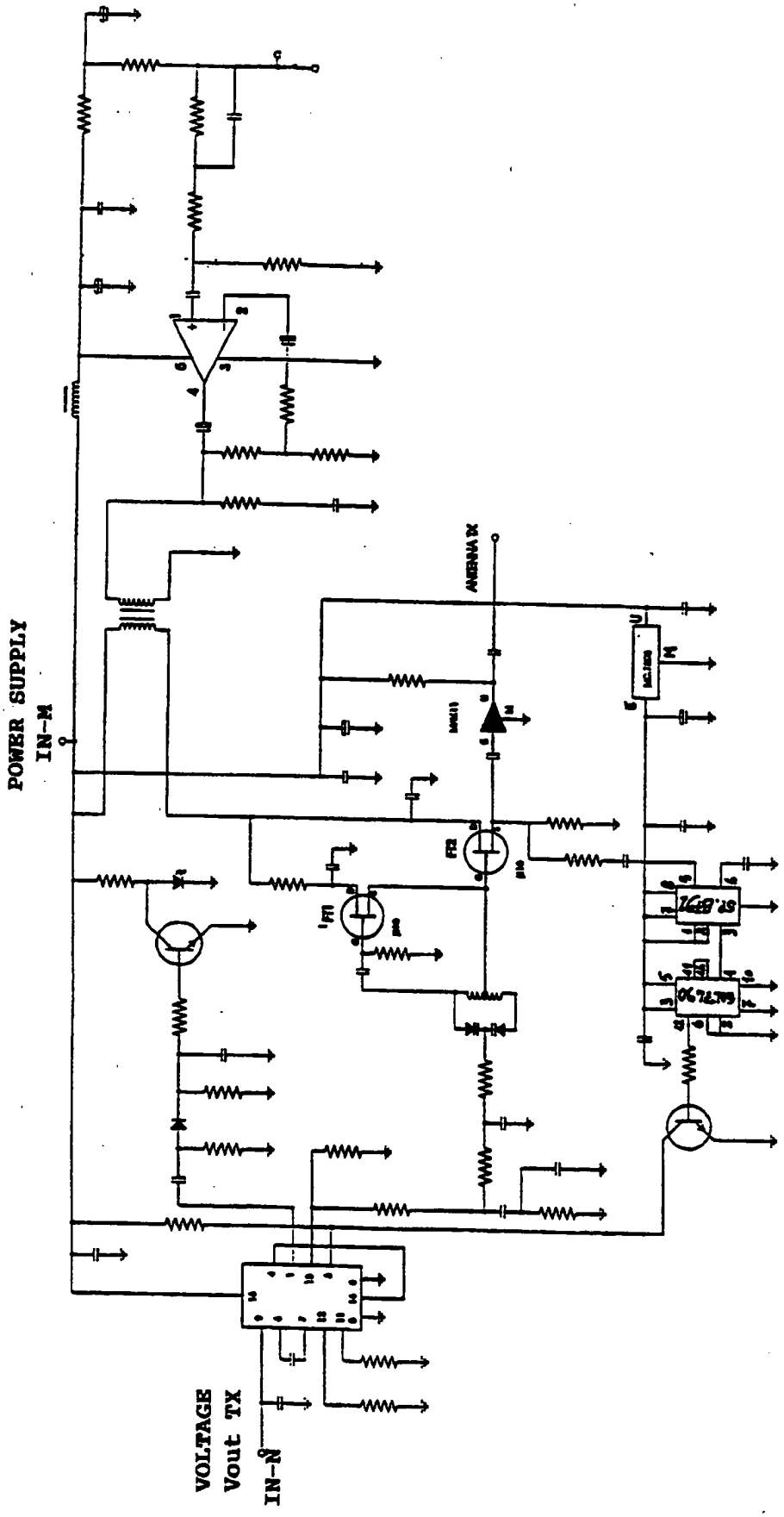

FIG. 5

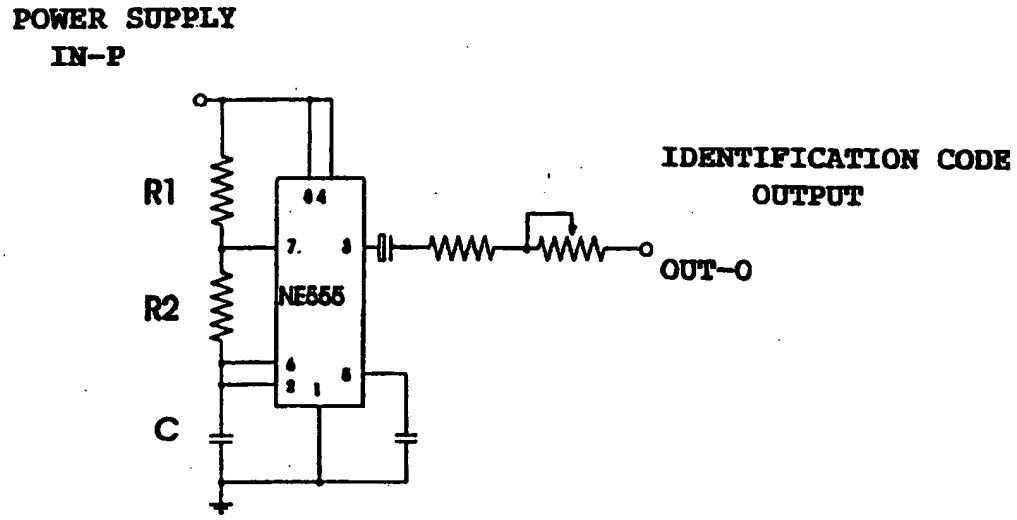
POWER SUPPLY
IN-P
R1
R2
C
NE555
IDENTIFICATION CODE
OUTPUT
OUT-O

FIG. 6

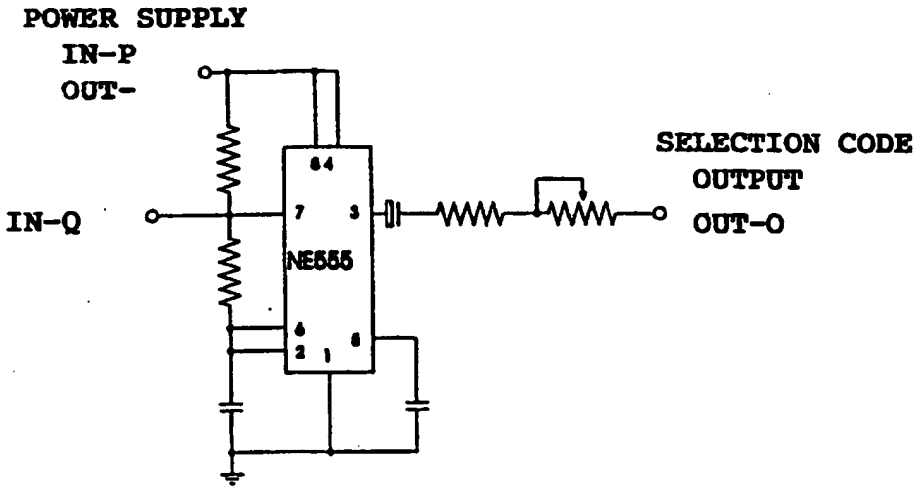
POWER SUPPLY
IN-P
OUT-
IN-Q
NE555
SELECTION CODE
OUTPUT
OUT-O

FIG. 7

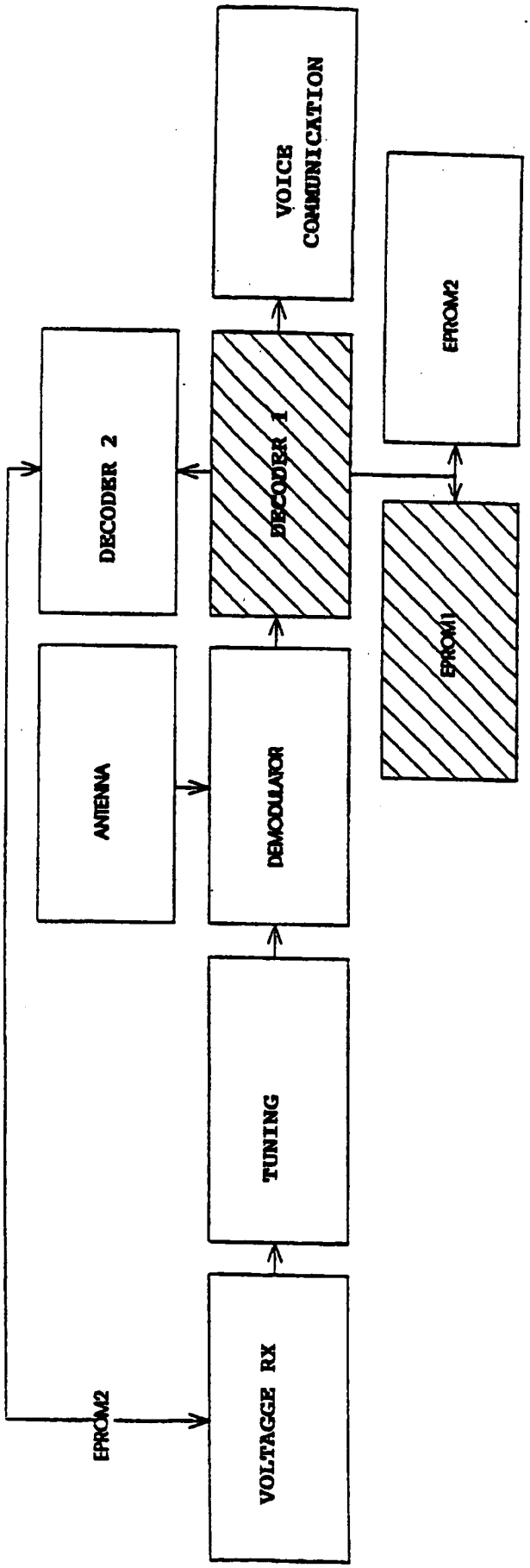
VOICE COMMUNICATION
EPROM2
DECODER 2
DECODER 1
EPROM1
ANTENNA
DEMODULATOR
TUNING
EPROM2
VOLTAGGE RX

FIG. 8

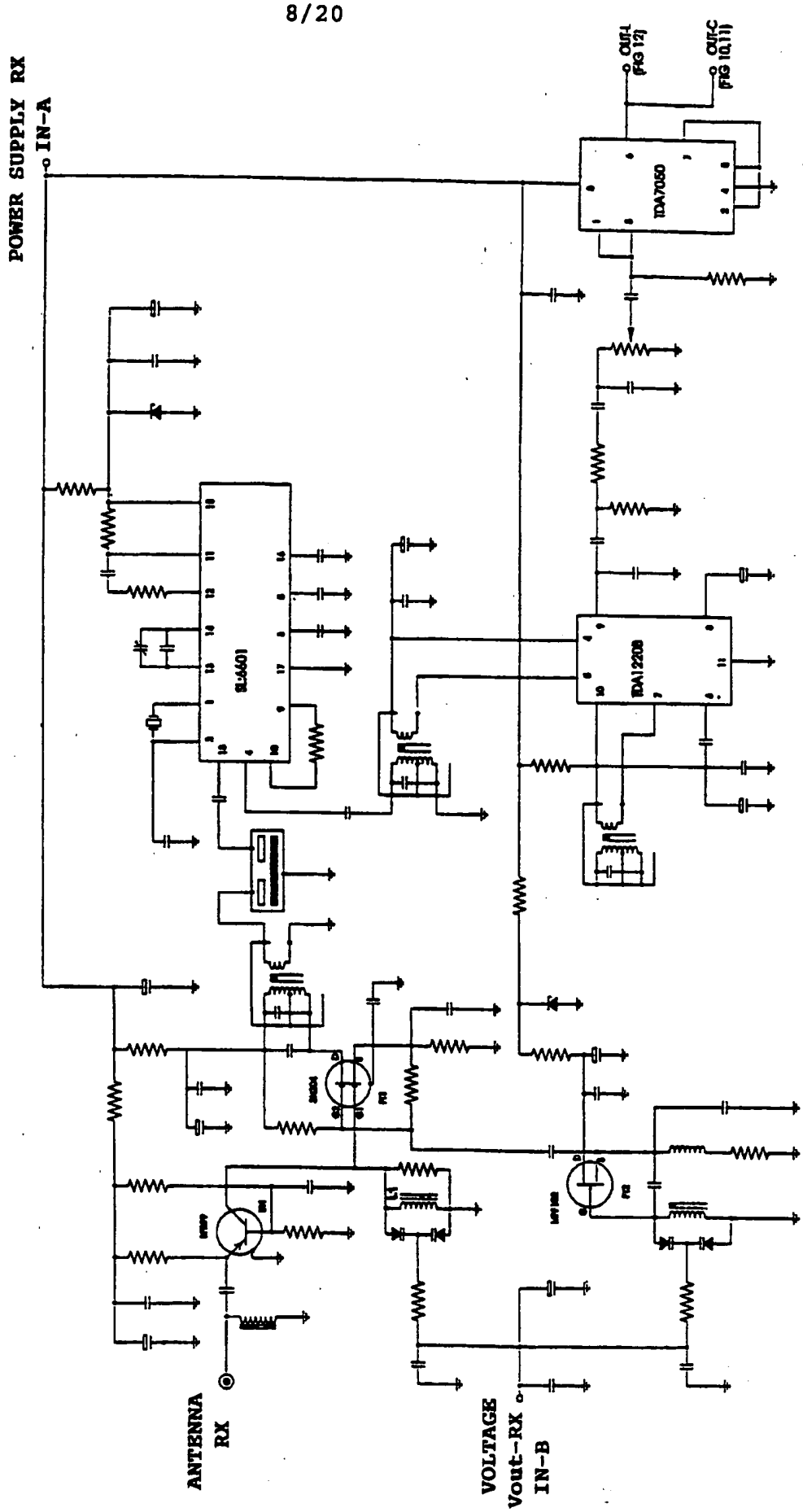
POWER SUPPLY RX
IN-A
OUT-1
(FIG 1/2)
OUT-C
(FIG 10,11)
TDA7050
SL6601
TDA1220B
ANTENNA
RX
VOLTAGE
Vout-RX
IN-B

FIG. 9

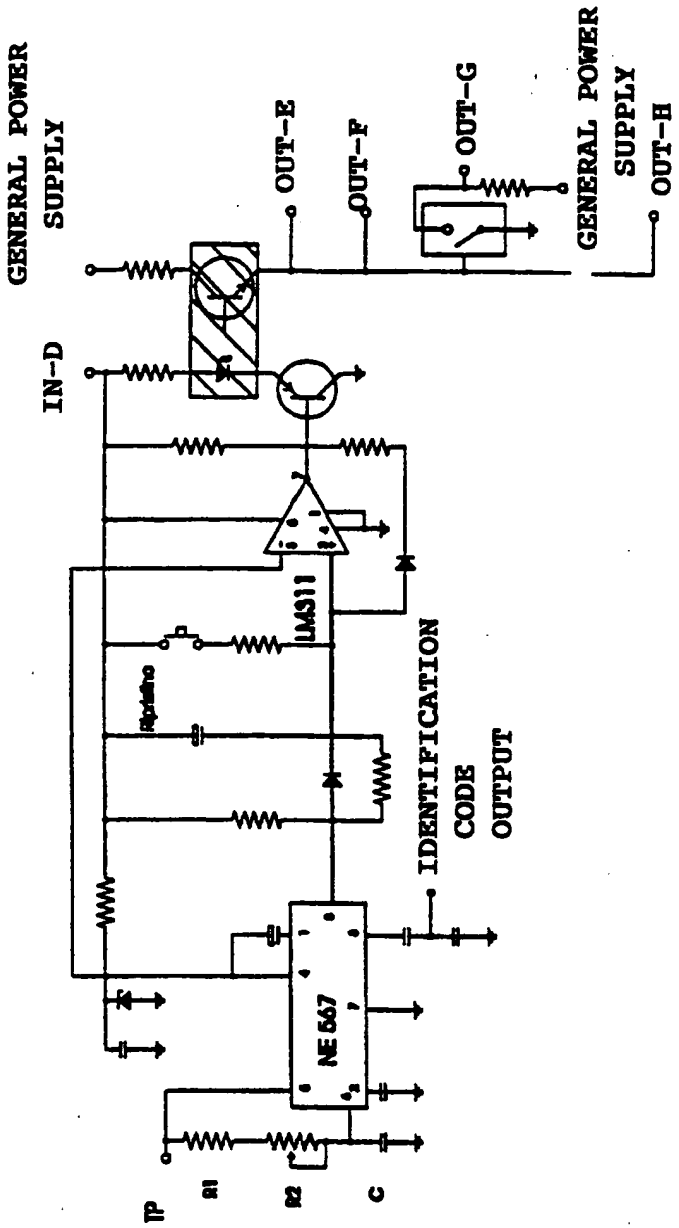
GENERAL POWER SUPPLY
OUT-E
OUT-F
OUT-G
GENERAL POWER SUPPLY
OUT-H
IN-D
LM311
IDENTIFICATION CODE OUTPUT
NE 567
TP
R1
R2
C

FIG. 10

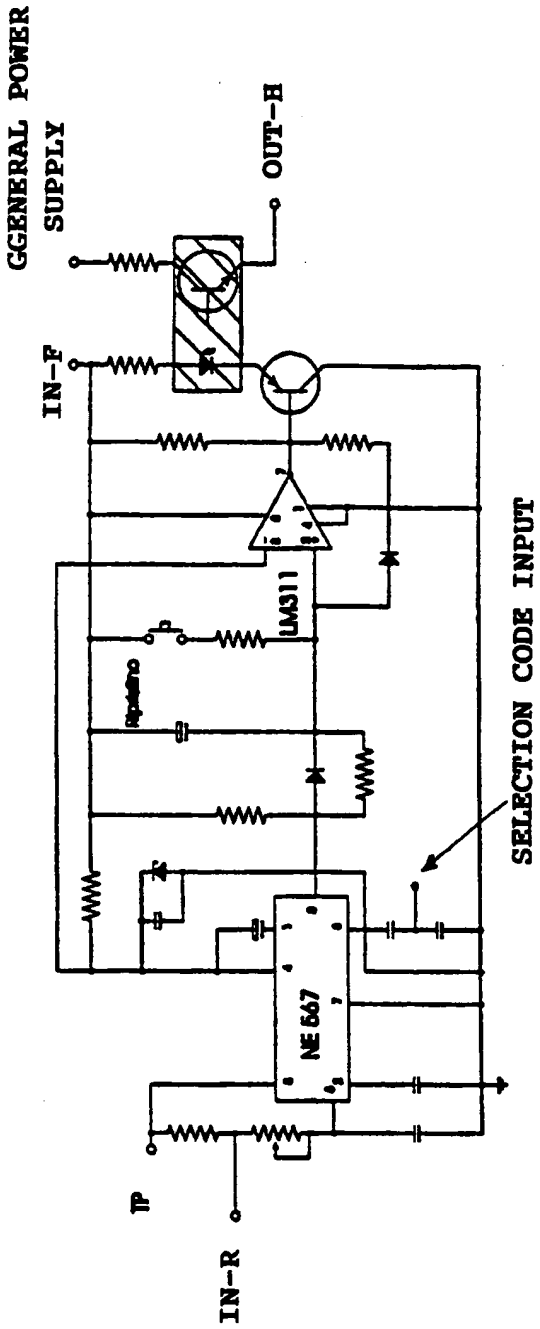
GGENERAL POWER SUPPLY
OUT-H
IN-F
LM311
SELECTION CODE INPUT
NE 567
IN-R

FIG. 11

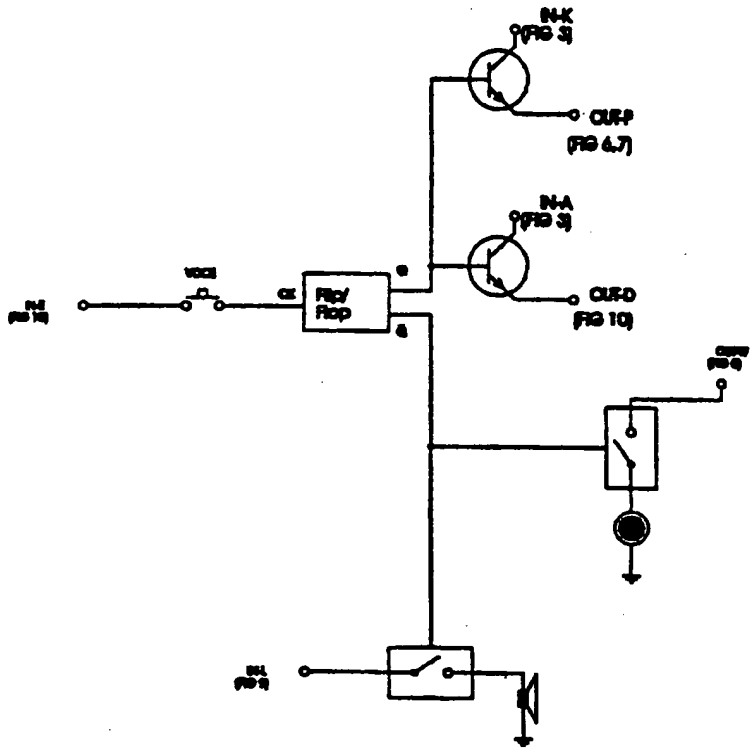

FIG. 12

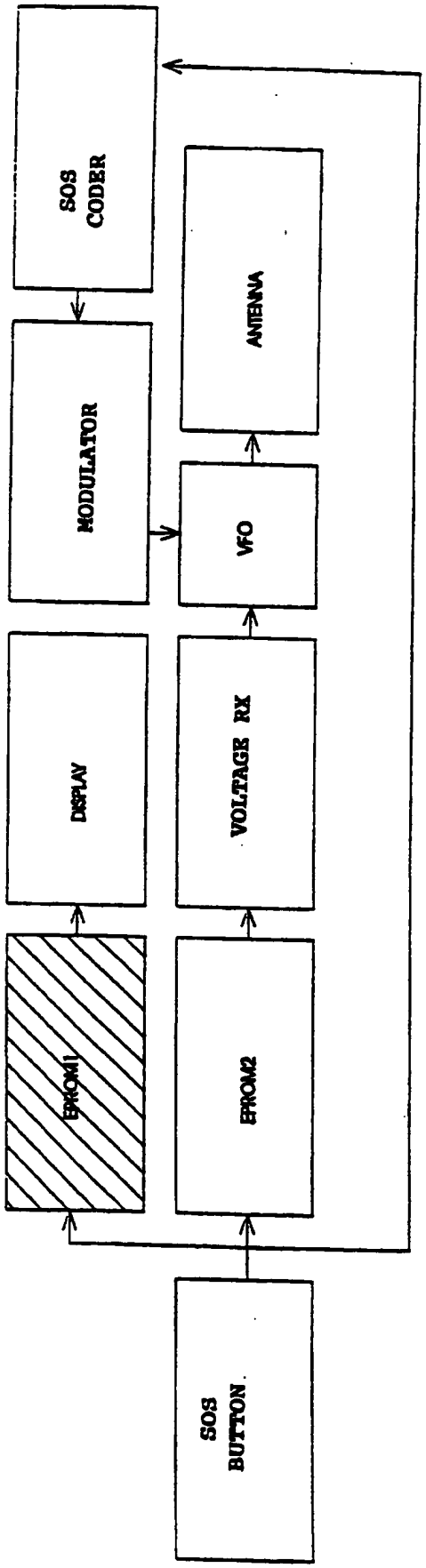
SOS CODER
ANTENNA
MODULATOR
VFO
DISPLAY
VOLTAGE RX
EPROM1
EPROM2
SOS BUTTON

FIG. 13A

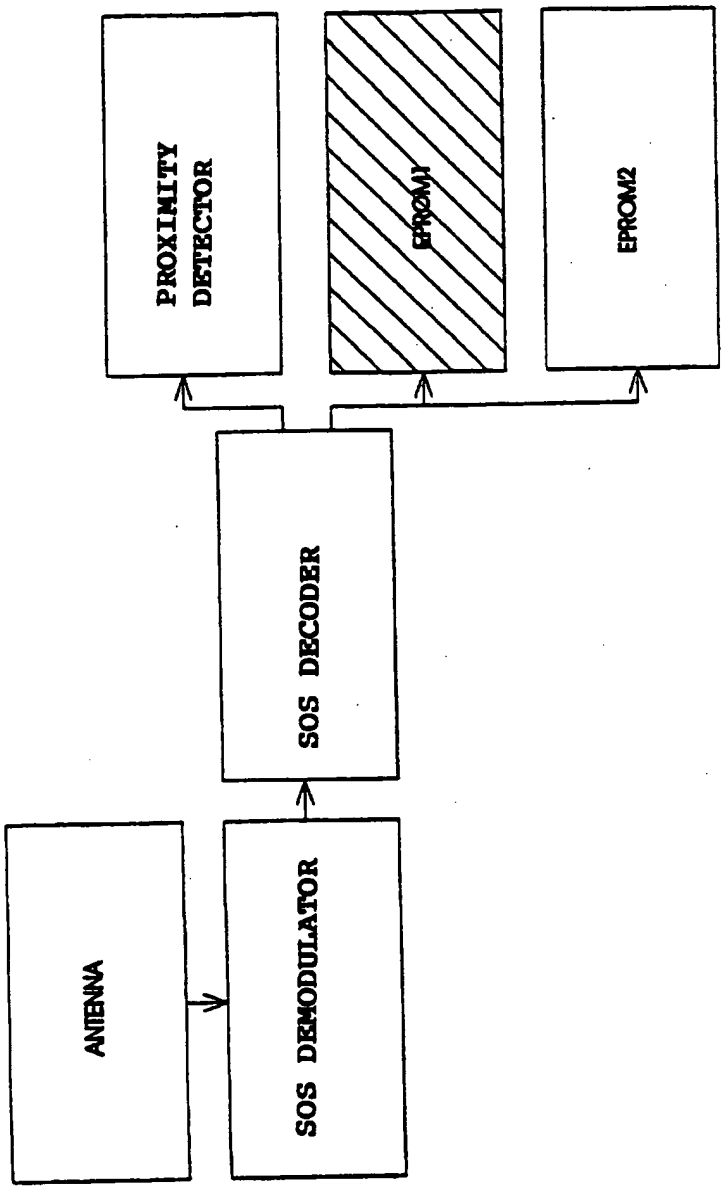
PROXIMITY DETECTOR
EPROM1
EPROM2
SOS DECODER
ANTENNA
SOS DEMODULATOR

FIG. 13B

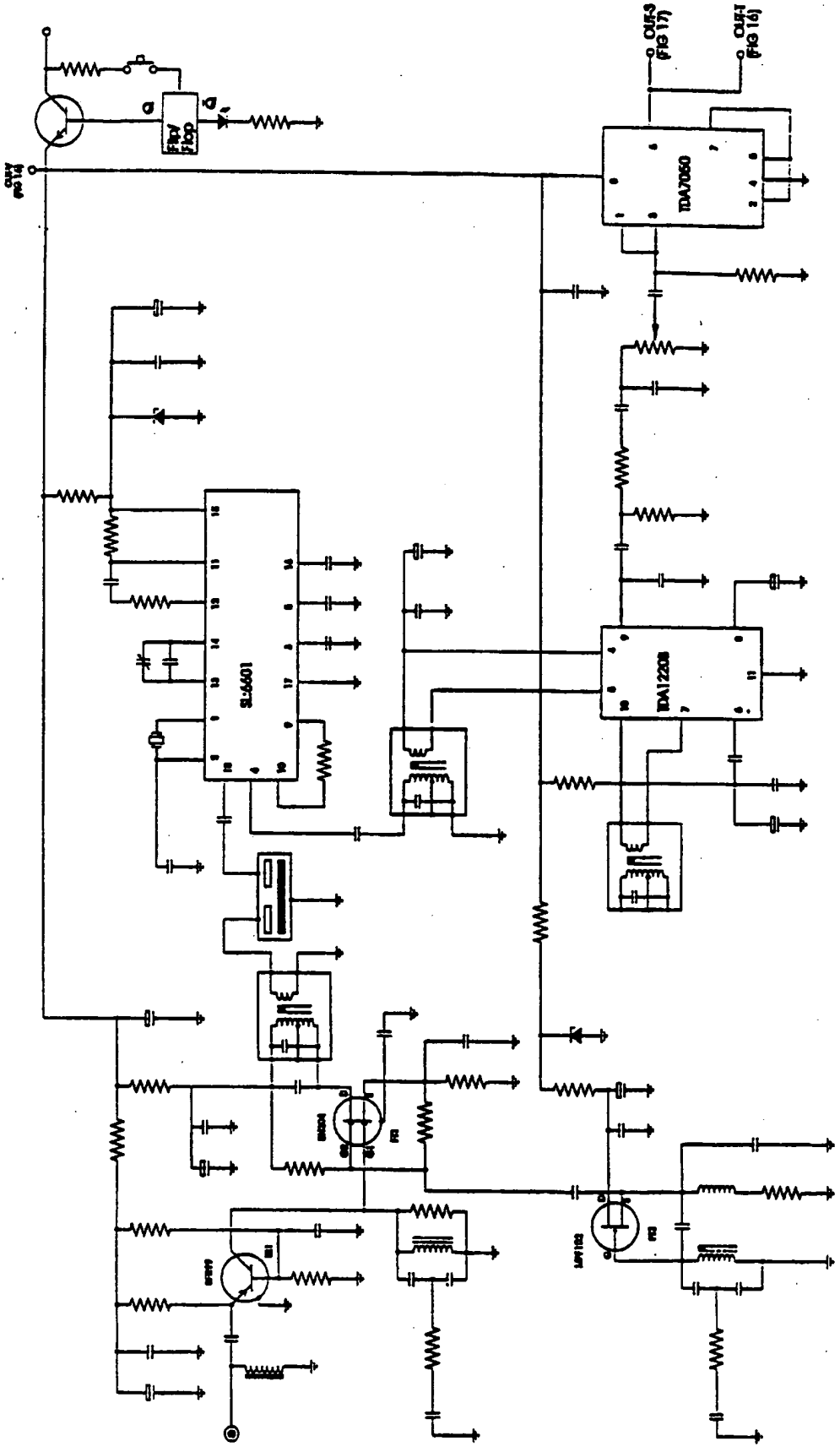

FIG. 14

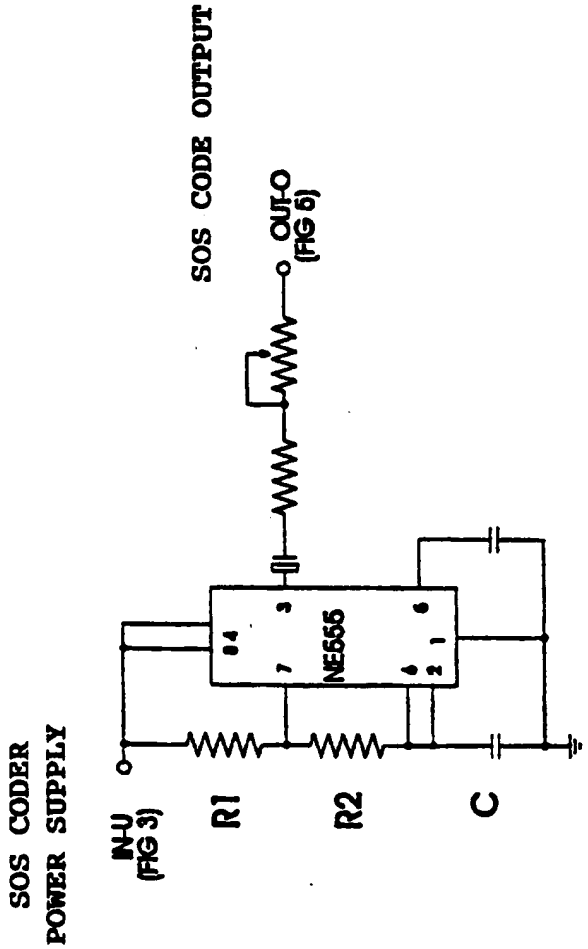
SOS CODE OUTPUT
OUT-O
(FIG 6)
NE555
SOS CODER
POWER SUPPLY
IN-U
(FIG 3)
R1
R2
C

FIG. 15

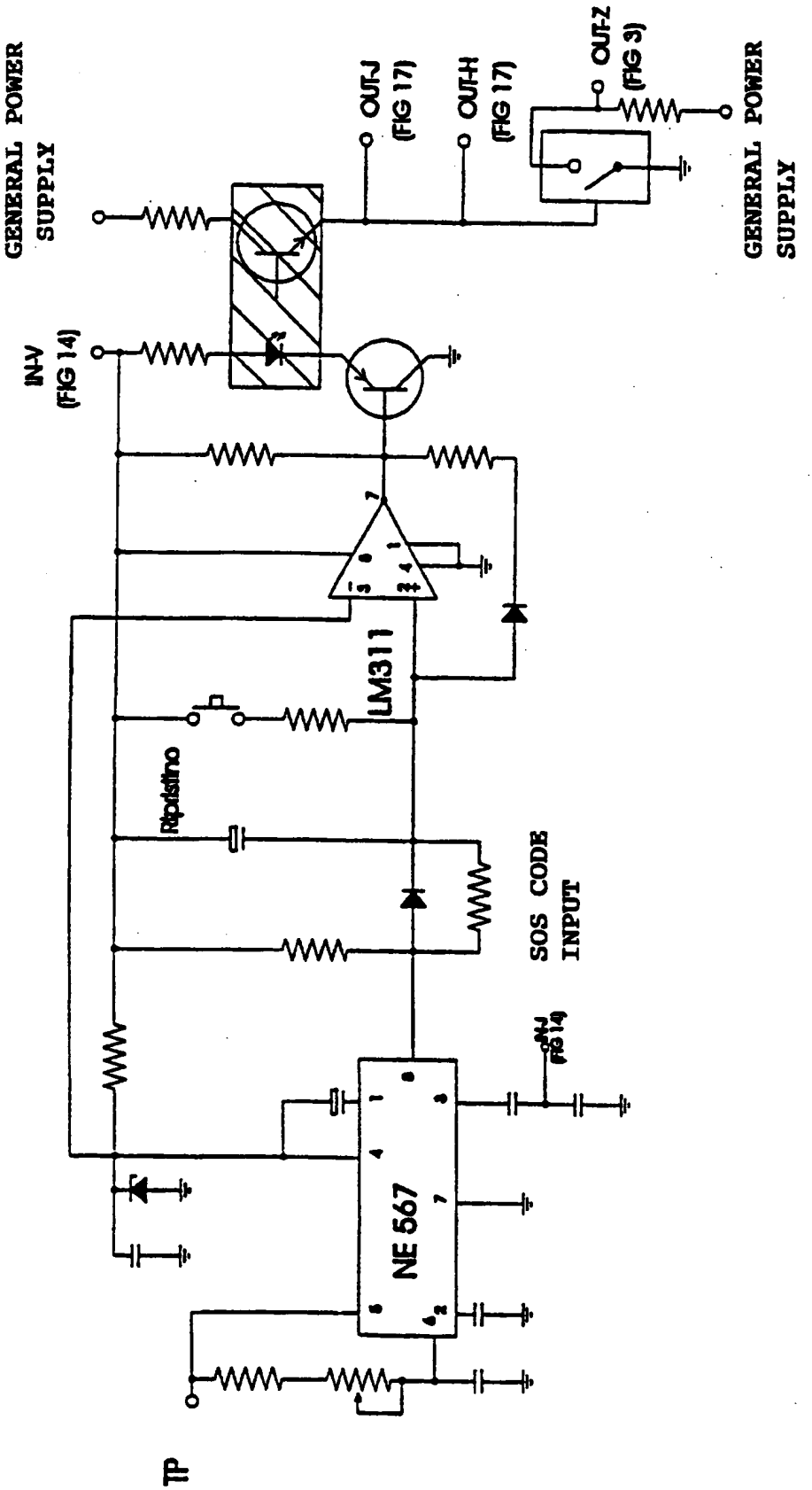
GENERAL POWER SUPPLY
OUT-J (FIG 17)
OUT-H (FIG 17)
OUT-Z (FIG 3)
GENERAL POWER SUPPLY
IN-V (FIG 14)
LM311
Ripristino
SOS CODE INPUT
NE 567
TP

FIG. 16

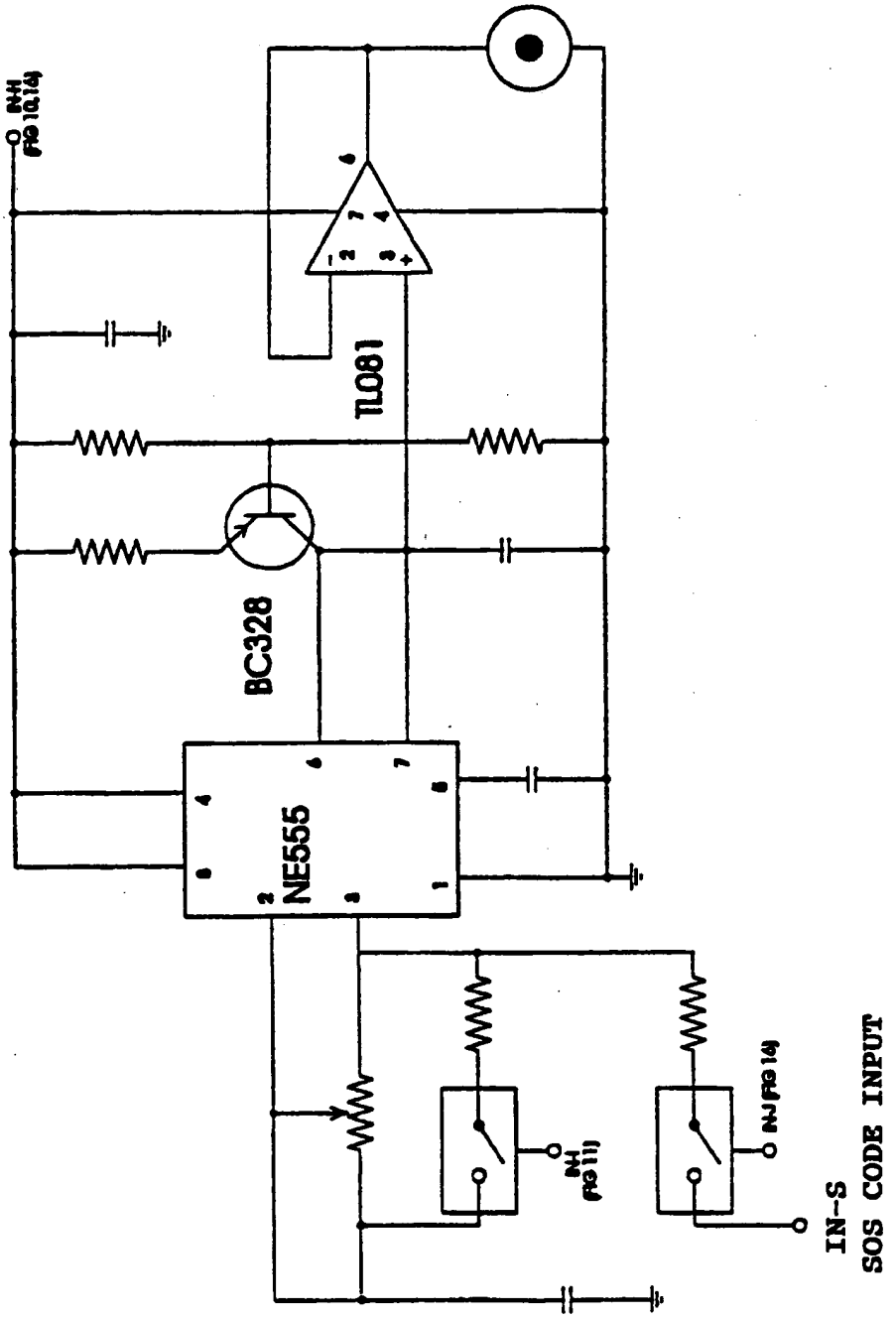

FIG. 17

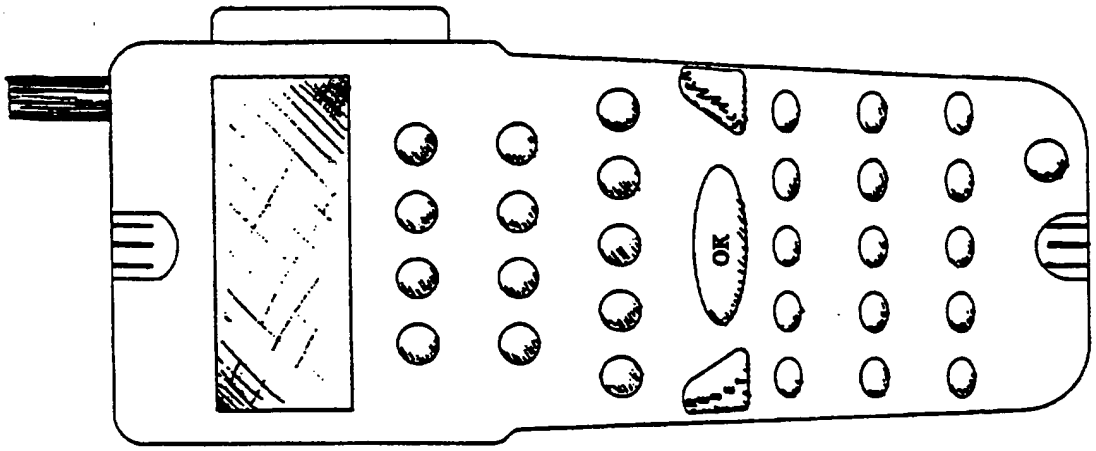

FIG. 18B

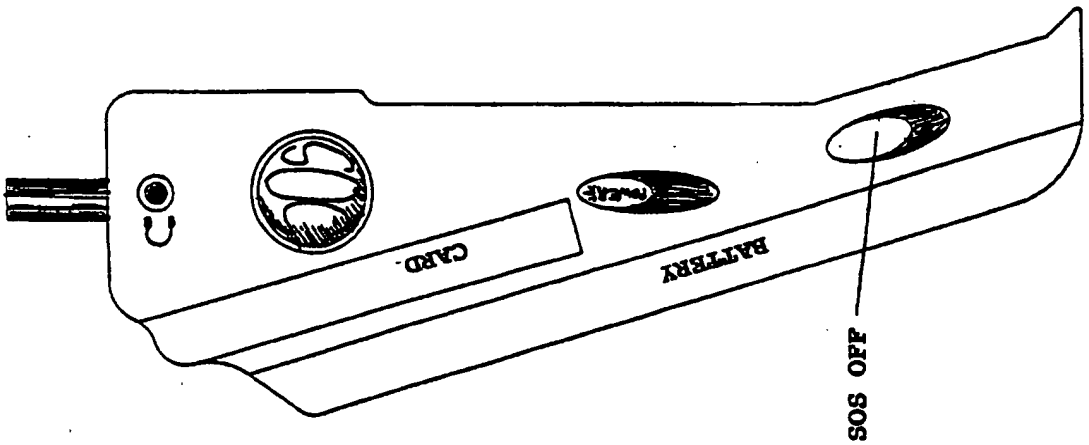

FIG. 18A

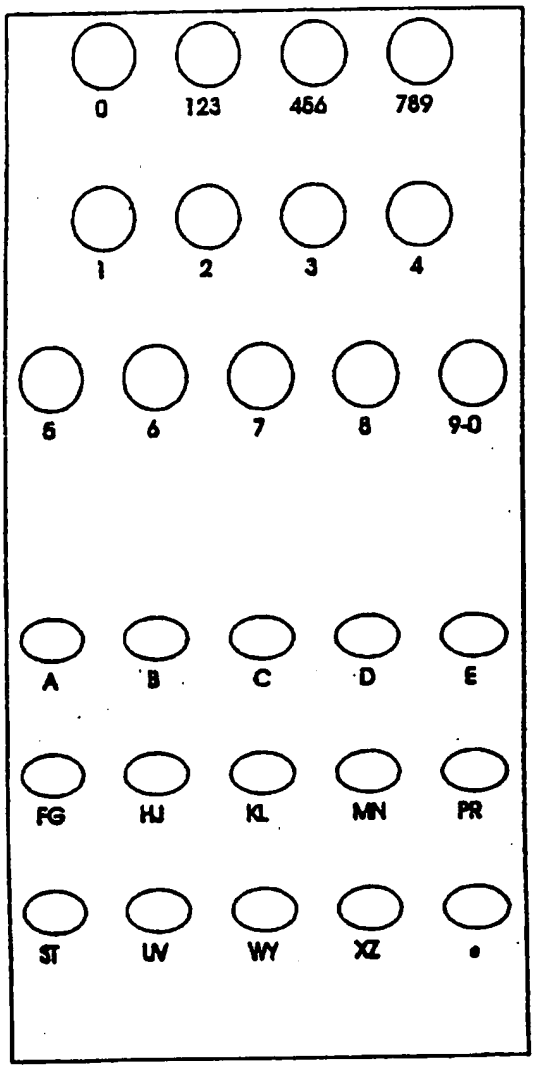

FIG. 19A

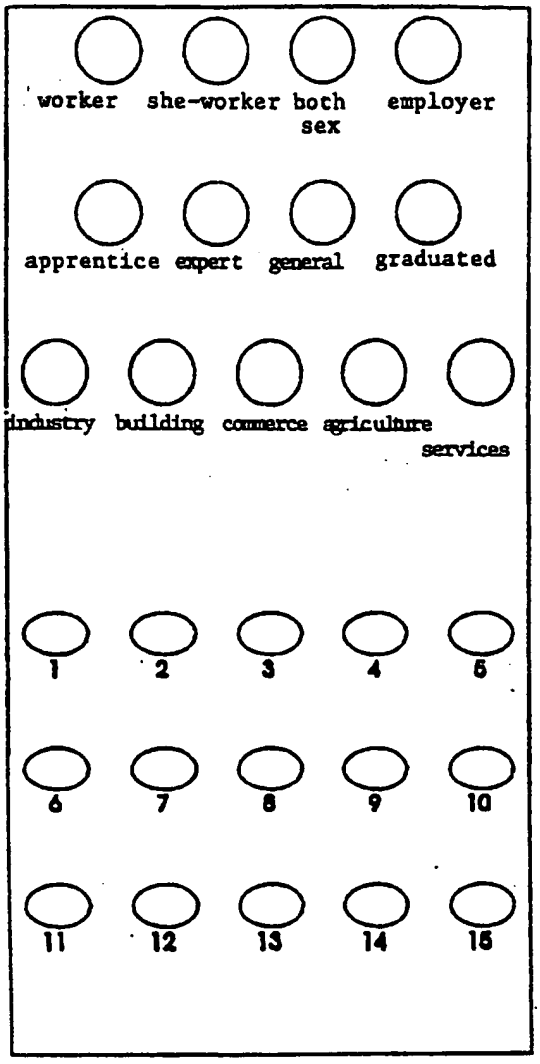

FIG. 19B

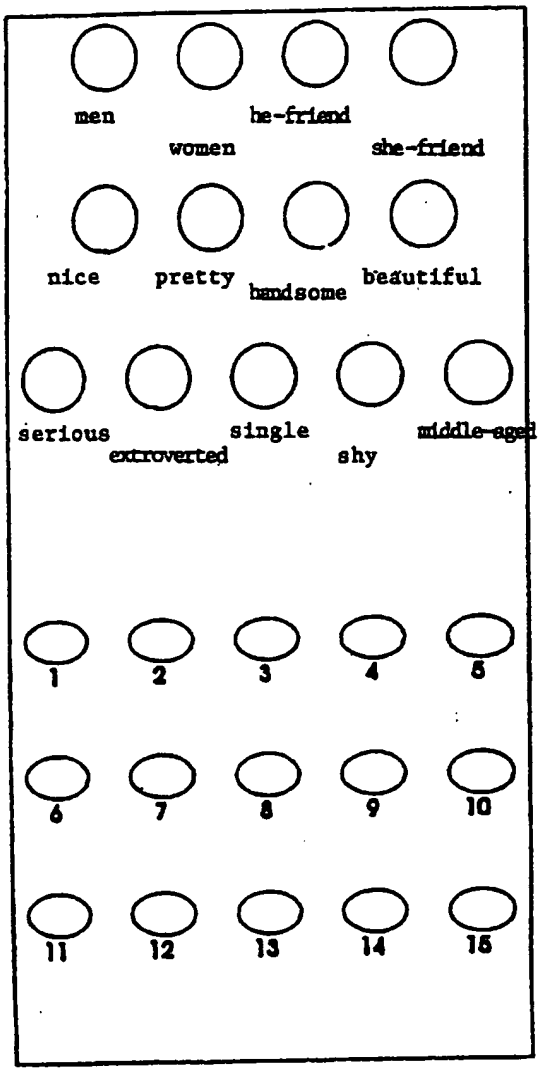

FIG. 19C

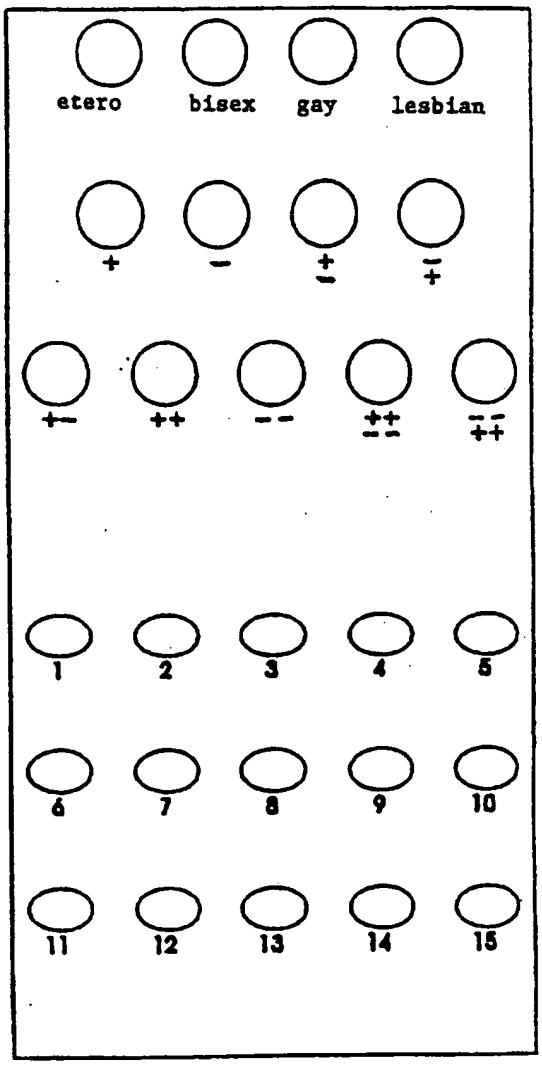

FIG. 19D

INTERNATIONAL SEARCH REPORT

Interna al Application No
PCT/IT 97/00145

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04B1/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04B H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	FR 2 615 957 A (DUPUCH CHARLES) 2 December 1988 see the whole document	1-4
A	EP 0 461 571 A (GRUNDIG EMV) 18 December 1991 see abstract; figures 1,2	1,3,15
A	EP 0 317 230 A (NIPPON ELECTRIC CO) 24 May 1989 see abstract; figure 1	1,3,5

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

1

Date of the actual completion of the international search	Date of mailing of the international search report
1 October 1997	- 9. 10. 97

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Andersen, J.G.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

mation on patent family members

Interna al Application No
PCT/IT 97/00145

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2615957 A	02-12-88	NONE	
EP 0461571 A	18-12-91	DE 4019010 A	02-01-92
		AT 147215 T	15-01-97
		DE 59108439 D	13-02-97
EP 0317230 A	24-05-89	JP 1128627 A	22-05-89
		AU 623612 B	21-05-92
		CA 1331207 A	02-08-94
		DE 3853405 D	27-04-95
		DE 3853405 T	27-07-95